

SELF-ALIGNED SOI WITH DIFFERENT CRYSTAL ORIENTATION
USING WAFER BONDING AND SIMOX PROCESSES

ABSTRACT OF THE DISCLOSURE

The present invention provides integrated semiconductor devices that are formed upon an SOI substrate having different crystal orientations that provide optimal performance for a specific device. Specifically, an integrated semiconductor structure including at least an SOI substrate having a top semiconductor layer of a first crystallographic orientation and a semiconductor material of a second crystallographic orientation, wherein the semiconductor material is substantially coplanar and of substantially the same thickness as that of the top semiconductor layer and the first crystallographic orientation is different from the second crystallographic orientation is provided. The SOI substrate is formed by wafer bonding, ion implantation and annealing.